# San Francisco Bay Crossings Study

# ENVIRONMENTAL AND SOCIO-ECONOMIC REPORT

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**Prepared by**
**Baseline Environmental Consulting**
**Korve Engineering, Inc.**

**Prepared for**
## Metropolitan Transportation Commission

# ENVIRONMENTAL AND SOCIO-ECONOMIC REPORT

## *INTRODUCTION*

The purpose of this report is to provide a preliminary and generalized assessment of important environmental issues and social/economic benefits for each of six conceptual San Francisco Bay crossings. This report is not an Environmental Impact Report or Statement prepared in accordance with State or federal requirements. The depth of the analysis and discussion of potential mitigation is limited by the conceptual engineering studies that have been prepared for each of the alternatives. Only conceptual alignments drawn on aerial maps with few cross-section drawings have been prepared to date. Some major engineering issues generated by these alternatives have yet to be resolved. Detailed environmental analysis would be conducted when more detailed engineering is completed.

## *ALTERNATIVE 1 - EXPRESS BUS, HOV, AND OPERATIONAL IMPROVEMENTS FOR ALL CORRIDORS*

### Land Use/Right of Way

Alternative 1 consists of 16 operational improvements related to express bus, high occupancy vehicle, and to the existing transbay corridors (I-80, SR 92, SR 84) and their approach facilities. A majority (12 of 16) of the proposed improvements involves work that would be completed within the existing right-of-way of the freeways and approach ramps. The projects include restriping of existing lanes; extensions of existing HOV/Fastrak lanes within existing right-of-way; prohibition of parking on San Francisco approach streets; restriction and relocation of casual carpool locations; and construction of new HOV ramps and park and ride lots. There would be no anticipated land use or right-of-way impacts related to these 12 operational improvements, with the exception of construction of two new park and ride lots planned near new HOV ramps at the Hesperian Boulevard/SR 92 and Newark Boulevard/SR 84 interchanges. The exact location for the two planned park and ride lots has not been identified at this time, so right-of-way and land use impacts cannot be assessed.

The four remaining proposed improvements that could have land use and/or right-of-way impacts include: construction of an aerial left-side HOV lane on the I-580 approach to the I-80 toll plaza; modification to the existing HOV lane approaching the toll plaza on westbound I-80; construction of direct HOV flyover lanes from eastbound SR 84 to northbound I-880; and extension of HOV lanes on SR 92 from Hesperian Boulevard to I-880.

Construction of an aerial I-580 HOV lane through the distribution structure would require acquisition of right-of-way to place new columns to support the additional lane. This alternative is conceptually depicted in Figure 1. Land uses under the existing freeway approach to the Bay Bridge could be affected. Structures and existing parking lots could be displaced. For example, a newly constructed hotel in Emeryville (Extended Stay America) would lose a portion of its parking lot to construct the new lane and supporting columns.

Modification of the existing westbound I-80 HOV lane approaching the Bay Bridge toll plaza would involve constructing a concrete barrier to separate the HOV lane from mixed flow traffic. The new HOV lane alignment would be relocated approximately 20 feet to the north, resulting in the loss of some adjacent upland shrubbery along the existing right-of-way and adjacent Bay shoreline. Depending on final engineering plans, the new HOV lane alignment may extend beyond the existing right-of-way into the Bay shoreline,

which would require permitting from the Bay Conservation and Development Commission and, perhaps, some mitigation of impacts.

Construction of aerial HOV flyover lanes from eastbound SR 84 to northbound I-880 could apparently be completed within the existing interchange right-of-way. However, the new flyover facility would be located adjacent to the Ardenwood Regional Preserve, a working farm that is owned and operated by the East Bay Regional Park District. Construction of the aerial HOV connector could create visual and land use impacts on the regional preserve.

The extension of HOV lanes on the SR 92 freeway between Hesperian Boulevard and the I-880 interchange would require the widening of the existing six-lane freeway to add new HOV lanes, which would be located in the median. This alternative is conceptually illustrated in Figure 2. Mixed flow and auxiliary lanes would be relocated further toward the outer edge of the freeway, requiring the relocation of existing soundwalls. Some take of adjacent private property would be required. Approximately 50 adjacent lots occupied primarily by single family residences could be affected. It appears that most of the existing structures would not be directly impacted although some portion of back yards may be taken.

**Biology**

There would be only a minor potential for biological issues or concerns to be raised for all of the operational improvements since most of the improvements would be located within existing urban right-of-way with low habitat value and little or no potential for occurrence of special-status species or wetlands. As noted above, one operational improvement could affect biological resources related to the Bay shoreline. Modification of the existing westbound I-80 HOV lane approaching the Bay Bridge toll plaza could resulting in the loss of some adjacent upland shrubbery along the existing right-of-way and adjacent Bay shoreline.

**Geology**

The geological and seismic impacts associated with the improvements would be addressed by ensuring that the improvements are designed considering the seismic environment of the Bay Area. The active Hayward, San Andreas, and Calaveras faults are all located less than 20 miles from the project area. The individual components of this alternative do not cross the known active traces of these faults. Any improvements would need to conform to latest earthquake design standards.

**Water Quality / Dredging / Disposal**

All of the alternatives could have adverse impacts on water quality related to construction activities. A general discussion about water quality impacts and typical mitigation would apply to all of the alternatives and is addressed under Alternative 2.

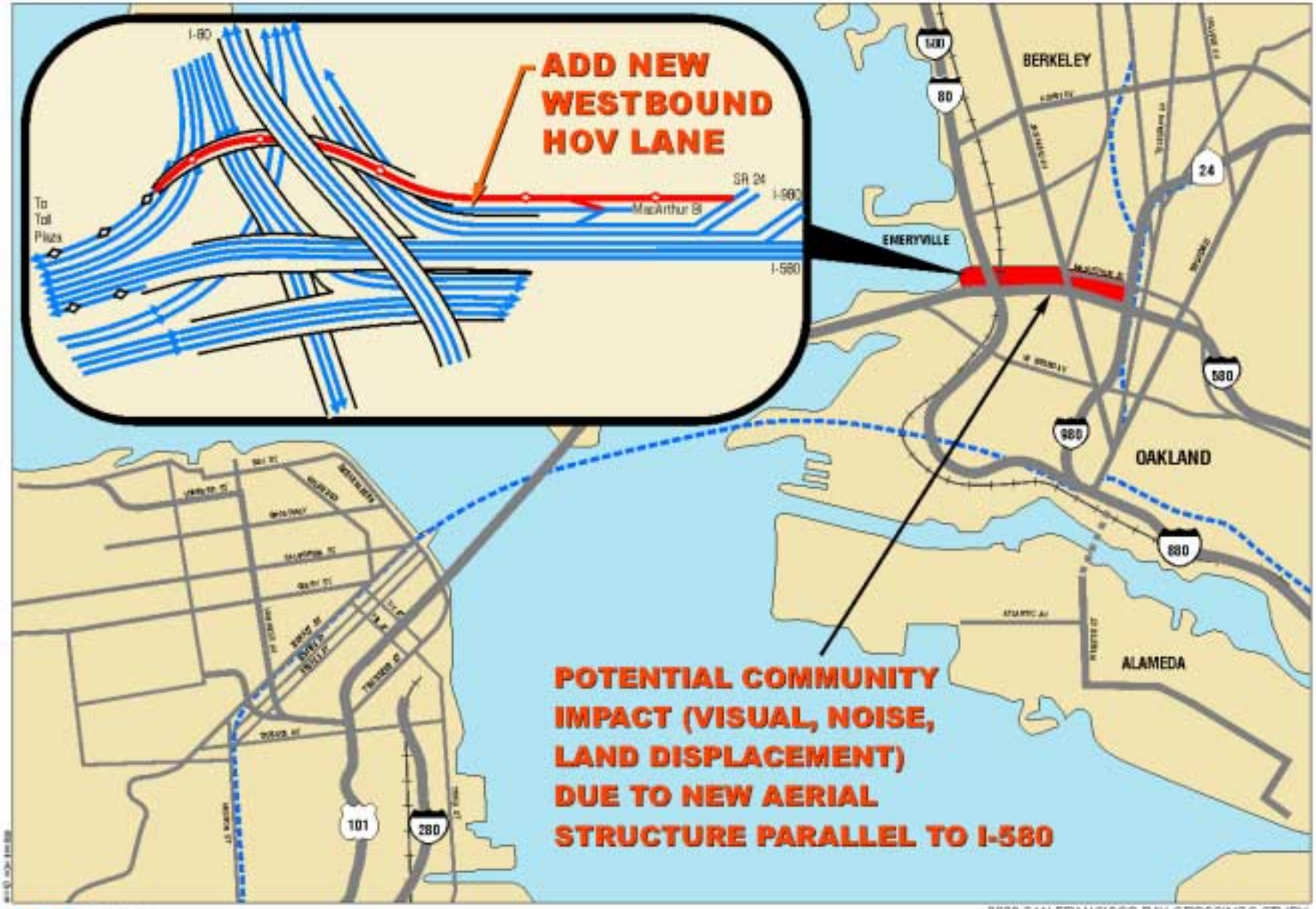


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**Figure 1**

**NEW WESTBOUND 1-580 HOV LANE**

**Project with Possible "High" Environmental Impact**

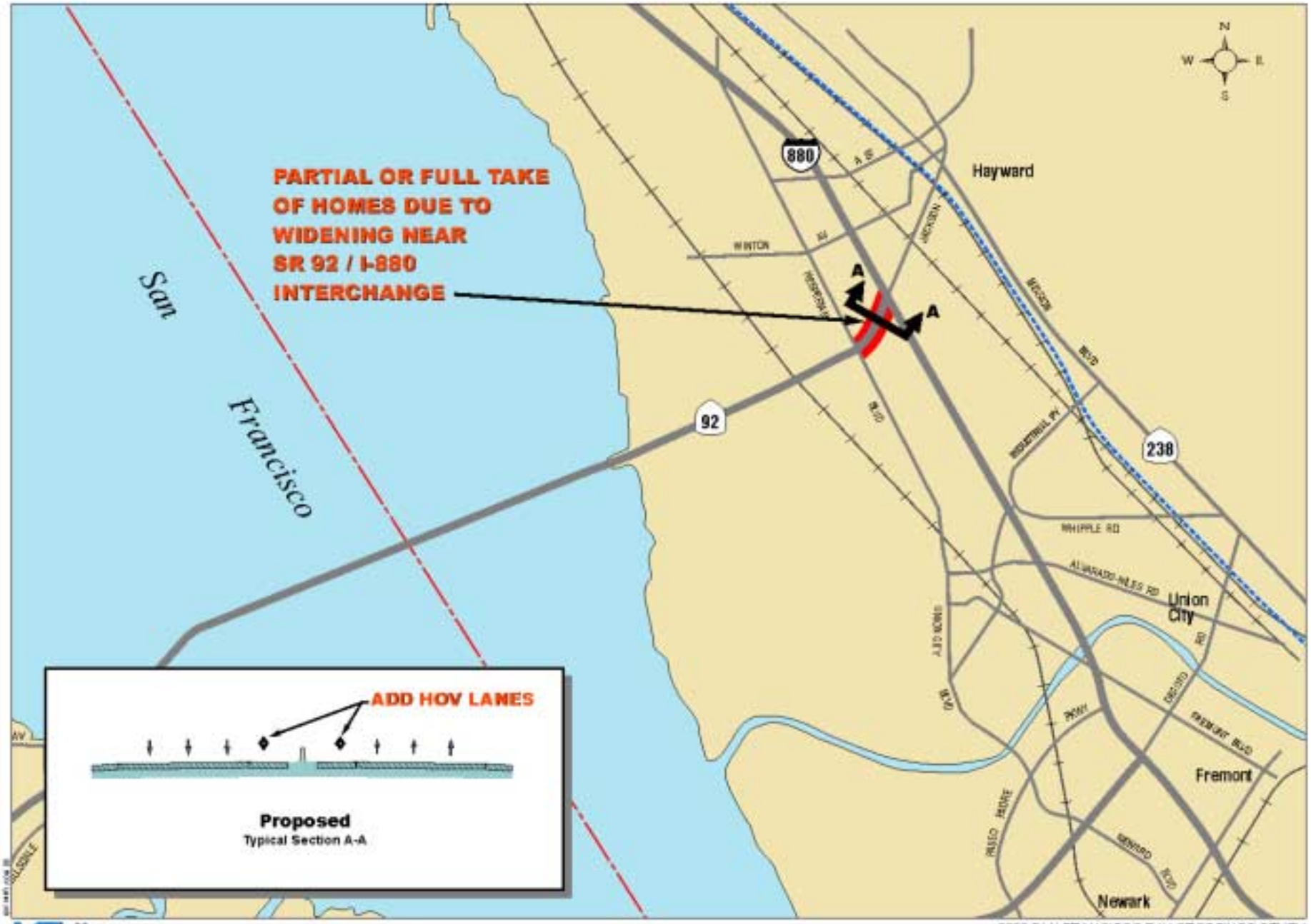


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**Figure 2**

**EXTEND SR 92 HOV LANES**

**Project with Possible "High" Environmental Impact**

**Noise and Vibration**

Construction activities associated with each of the 16 operational improvements could generate noise and vibration impacts to adjacent land uses. However, as noted above, most of the improvements would occur within existing rights-of-way. The proposed improvements that would result in the most significant noise or vibration impacts include construction of an aerial westbound I-580 HOV lane through the distribution structure, and the widening of the SR 92 freeway between Hesperian Boulevard and I-880. Construction of new HOV lanes on this portion of SR 92 could involve the demolition of existing soundwalls and use of heavy equipment that could affect approximately 50 adjacent single family homes. Typical noise and vibration impacts due to heavy construction are described in Alternative 3, below.

**Air Quality**

Typical air quality impacts due to emissions from heavy construction are described in Alternative 3, below.

As with all of the alternatives, regional emissions of ozone forming pollutants will continue to decline over the next twenty years due to cleaner cars and trucks in the regional fleet. Particulate matter from entrained dust which is produced by vehicles traveling over Bay Area freeways will likely increase with additional traffic over the same period.

This alternative increases daily engine starts by less than 0.1%. The change in ROG, NOx, and PM10 emissions at the regional level due to construction of these improvements is less than 1%. These results are not considered significant (see Table 2 at the end of this report).

**Visual**

Visual impacts would not be expected for the new facilities would be located within the right-of-way of existing freeways or approach roads. Visual impacts could occur to adjacent single family residences along the SR 92 freeway between Hesperian Boulevard and I-880 where existing soundwalls could be relocated closer to structures.

Visual impacts could also occur to the Ardenwood Regional Preserve, a component of the East Bay Regional Park District, due to construction of an aerial HOV connector at I-880/SR 84. The existing visual environment at the distribution structure at the approach to the Bay Bridge would be changed with the construction of a new westbound I-580 HOV lane. Views experienced by residents and businesses in the area of the existing I-580 freeway could be affected and the new lane could shade land uses under or near the elevated freeway.

**Economic Development**

Construction of the express bus, high occupancy vehicle, and operational improvements to the existing transbay corridors and their approach facilities could have beneficial economic development impacts to the region be reducing congestion during peak periods in some areas.

**Equity**

The following discussion would apply to all of the alternatives. The Bay Crossing Study analysis of equity impacts is similar to the methodology used for the social equity analysis of the Environmental Justice Report for the Report for the 2001 Regional Transportation Plan (September, 2001). That effort identified 42 "low-income" and "minority" communities, also referred to as "communities of concern".1

The 2001 Regional Transportation Plan equity assessment involved, in part, three criteria: (1) average travel time for low-income and minority communities compared to not-low-income and non-minority communities; (2) transit travel time from target communities to regional job centers; and (3) accessibility to jobs from representative target communities (meaning the number of jobs that can be reached within a specified travel time). Detailed tables showing complete results for these three criteria are included in tables at the end of this report.

In general, minority and low-income communities in the Bay Area are similarly affected, in terms of their travel conditions, as non-minority and not-low-income communities for each of the Bay Crossing alternatives. The communities of concern tend to have shorter average travel time than not-low-income and non-minority communities in all six alternatives, largely because most of the communities are concentrated around the Bay and along major highway and transit arteries. However, none of the alternatives results in substantial change in average travel time for any of the analysis groups because transbay travel remains a relatively small share of total travel for any of the analysis groups (MTC, 2002). The discussion under each alternative presents examples of significant benefits or negative impacts to target communities. Since changes in average travel time were minimal, most examples illustrate changes in transit travel times to job centers, and accessibility to jobs from selected target communities.

Assuming construction of all of the improvements proposed in Alternative 1, the most significant benefit is a large improvement in access to jobs by transit from South San Francisco, Hayward, and Richmond because of the new express bus service. For example, the number of jobs accessible by a transit trip within 40 minutes from Richmond and South San Francisco would increase by 40 and 15 percent, respectively, over the baseline conditions (MTC, 2002).

## *ALTERNATIVE 2 - RAIL/BART IMPROVEMENTS IN THE BAY BRIDGE CORRIDOR*

**Land Use / Right of Way**

Assuming a state-of-the-art boring construction technology is employed for the tunneling, land use and right-of-way impacts to existing residential neighborhoods, commercial and industrial areas in San Francisco, Oakland, and Alameda would be limited, since only relatively minimal above-ground trenching would be involved. This alternative and its likely environmental impacts are conceptually illustrated in Figure 3.

1 Low-income communities are defined as those in which 30% or greater of the population is at or below 200% of the US Department of Health and Human Services Poverty Guidelines. Minority communities are defined as those in which 70% or more of residents are African American, Asian American, Hispanic, and Native American, which are the minority populations defined in U.S. Department of Transportation Environmental Justice Guidelines.

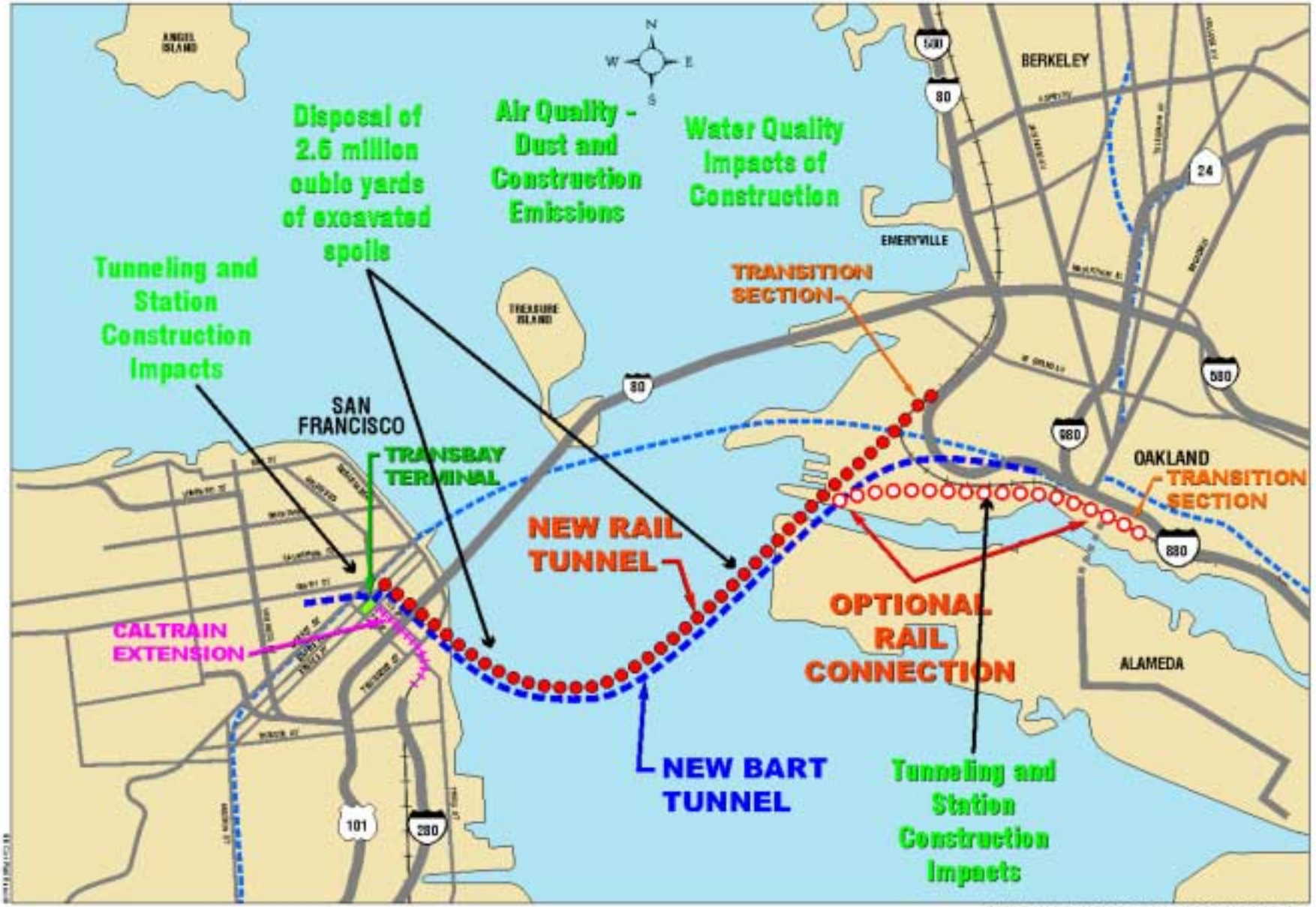


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Figure 3

ALTERNATIVE 2

BAY BRIDGE CORRIDOR RAIL ENVIRONMENTAL IMPACTS

The environmental issues associated with using a world class tunnel boring technology are difficult to assess and are beyond the scope of this preliminary environmental evaluation. The state of the art boring machines currently on the market have yet to be employed in any major city in the United States on the scale of the rail tunnel proposed in Alternative 2. Thus, a documentation of environmental issues is not available. However, several recent projects overseas have been completed or are under construction. Further study of these projects should verify if the scope of environmental issues identified here is accurate.

A European firm, Herrenknecht AG, claims to be "the only company in the world that develops, manufactures and sells the entire range of mechanical tunneling machines" (Herrenknecht AG, 2002). The firm has worked on more than two dozen large scale tunneling projects around the world, including two 6,600-meter (4.1 mile) road tunnel in Westerschelde, Netherland and a 5,577-meter "rain water canal" in New York City. These two major tunnel projects are shorter in distance than the proposed BART and commuter rail tunnel.

Use of a boring machine to construct the two tunnels would mean that land use and right-of-way impacts would be significantly reduced compared to conventional trenching or cut and fill construction methods. Construction of new BART stations in Jack London Square, Post Street, and Union Square would be underground within the existing right-of-way, so land use impacts at these locations would also be minimized.

The only anticipated land use issues that may arise are at the entrances to the bored tunnel in West Oakland. The issue of how and where to store the large amount of excavated spoils from the tunneling (approximately 2.6 million cubic yards) could affect land uses near the entrances. The at-grade rail connection to existing freight/passenger rail lines in West Oakland (former Oakland Army base, now Oakland Base Reuse Authority) could also conflict with existing rail traffic and planned non-rail land uses.

**Biology**

There would be only a minor potential for biological issues or concerns due to the boring technology proposed for installing the tunnel. Most of the improvements would be located within existing urban areas with low habitat value and little or no potential for occurrence of special-status species or wetlands.

The boring would raise secondary concerns over the potential for encountering contaminated sediments and questions about the placement of disposed materials.

**Geology**

The geological and seismic impacts associated with Alternative 2 are primarily related to ensuring that the improvements to the Bay Bridge improvements are designed considering the seismic environment of the Bay Area. The active Hayward, San Andreas, and Calaveras faults are all located less than 20 miles from the project area. The components of this alternative do not cross the known active traces of these faults, but a seismic event along the faults would result in seismic shaking to various degrees, depending on the magnitude of the earthquake at any of the faults. Any improvements would need to consider the design earthquake and the associated effects to the structures.

**Water Quality/Dredging/Disposal**

All of the alternatives could have adverse impacts on water quality related to construction activities. The following general discussion about water quality impacts and typical mitigation would apply to all of the alternatives. Typical construction impacts include, but are not limited to: excavations for column and pier foundations, resulting in possible groundwater contamination; potential surface water impacts from dredging and dewatering operations, concrete placement, and washout activities; management and application of chemical products; the potential for accidental spills from construction equipment and materials; and potential discharges of waste material and resuspension of bottom sediments.

Statewide NPDES Permit No. CAS000003 applies to all of the alternatives during construction. The Caltrans NPDES permit requires that a Storm Water Pollution Prevention Plan (SWPPP) be prepared for any construction project that disturbs an area greater than five acres or for any project that is located within or near a water-related sensitive environment. The purpose of the SWPPP is to identify pollutant sources that may affect the quality of the discharges of storm water associated with the construction activities of the project. In addition, the SWPPP would identify, construct, and implement storm water pollution control measures to reduce pollutants in storm water discharges from the construction site during and after construction.

The objectives of the SWPPP are to minimize the degradation of off-site receiving waters to the maximum extent practicable using the current Best Management Practices (BMPs) for the construction industry, and to reduce the mass loading of chemicals and suspended solids to the downstream drainage systems and the receiving water bodies.

The preparation of the SWPPP would be based on the principles of BMPs, not numeric effluent limitations, to control and abate the discharge of pollutants into receiving waters. BMPs are structural devices, such as silt fences and straw bales, and non-structural devices, such as good housekeeping and construction-related waste management. Some of Caltrans' BMPs are:

- Spill Prevention and Control;
- Solid Waste Management;
- Hazardous Waste Management;
- Concrete Waste Management;
- Sanitary/Septic Waste Management;
- Vehicle and Equipment Maintenance;
- Straw Bales;
- Illicit Discharge/Illegal Dumping Reporting; and
- Liquid Waste Management.

The SWPPP would be amended whenever there is a change in construction or operations which may affect the discharge of substantial quantities of pollutants into the receiving waters (Caltrans, 2000).

Perhaps the most significant and complex environmental issue related to this alternative is how to characterize and dispose of the excavated and dredged materials that come out of the bored tunnel as it is being constructed. The amount of spoils materials that would be generated by the tunneling is approximately 1.1 million cubic yards (CY) for the second BART tunnel and approximately 1.5 million CY for the commuter rail tunnel, or a total of 2.6 CY. No bay bottom dredging is anticipated. The depth of the borings brings the tunnel into the older Bay Mud (Subrizi, 2002). The concern about contaminated soils would be confined to the ends of the tunnel, which would be bored closer to the bay floor surface.

The issue of how and where to dispose of dredged materials was extensively researched by Caltrans for the seismic upgrade of the East Span of the Bay Bridge project (Caltrans, 2000). The preferred reuse/disposal option outlined in the Final Environmental Impact Statement for that project is to beneficially reuse the majority of the dredged material at an available upland wetland restoration site, if such a site is available and cost-effective. If approved sites are not available, Caltrans may beneficially reuse materials at landfill sites as daily cover or dispose of materials at a deep ocean disposal site. Caltrans also plans on beneficially reusing some dredged material and excavated sand to restore a portion of the barge access channel at the Oakland touchdown of the new bridge to facilitate eelgrass colonization. A much smaller amount of material is proposed for disposal at the Alcatraz site. Dredged material determined to be unsuitable for aquatic disposal or wetland reuse would be taken to an appropriate landfill for disposal. Determination of the suitability of material during construction would be based on the results of the sediment sampling and analysis.

However, the excavated materials generated by the bored tunnels are not considered “dredged Bay materials” by the Bay Conservation and Development Commission (BCDC), and would not appropriate for disposal within the BCDC jurisdiction. According to BCDC staff, dredging refers to materials excavated from the Bay, not underneath the Bay. The San Francisco Bay Plan states; "[d]redging consists of excavating or extracting materials from the Bay." (Bay Plan Dredging Finding b., p. 27.) The materials excavated by boring underneath the Bay would not be considered dredged material by BCDC. For materials dredged from the Bay, The San Francisco Bay Plan provides that:

"[d]redged materials should, if feasible, be disposed outside the Commission's Bay and certain waterway jurisdictions. Except when reused in an approved fill project, dredged material should not be disposed in the Commission's Bay and certain waterway jurisdiction unless disposal outside these areas is infeasible and the Commission finds: (a) the volume to be disposed is consistent with applicable disposal allocations and disposal site limits adopted by the Commission by regulation; (b) disposal would be at a site designated by the Commission: (c) the quality of the material disposed of is consistent with the advice of the San Francisco bay Regional water Quality Control Board and the inter-agency Dredged material Management Office (DMMO); and (d) the period of disposal is consistent with the advice of the California Department of Fish and Game, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service." (Bay Plan Dredging Policy 3, p. 30.)

Thus, since BCDC would not view the materials bored from underneath the Bay as dredged materials, the materials could not be disposed in the Bay consistent with the Bay Plan dredging polices. The material would be treated as ordinary Bay fill and would have to be used for a water-oriented use or as a minor fill to improve shoreline appearance and public access to the Bay. On the other hand, if any of the proposed boring material was dredged from the Bay that material could be eligible to be placed in the Bay consistent

with the Bay Plan dredging policies and other relevant policies of the Bay Plan and the Commission's law, the McAteer Petris Act (Blanchfield, 2002).

For the East Span Final Environmental Impact Statement a range of 36 potential in-Bay, ocean, and upland/wetland reuse sites listed in the 1998 San Francisco Bay Conservation and Development Commission (BCDC) Roadmap were initially considered in the Dredge Material Management Plan prepared for the project. These sites were screened based on availability of the sites during the East Span Project construction time span (e.g., would the site be permitted and accepting dredged material by mid-2001) and the capability of the site to receive the volumes and type of material generated. Most of the sites considered were either reserved strictly for specific projects (e.g., Federal channel maintenance dredging) or were planned but would not likely have environmental permits needed prior to the start of the East Span Project dredging activities.

The above assessment narrowed the list of potential in-Bay, ocean, and upland/wetland reuse sites candidates to four practicable candidates: 1) Alcatraz site; 2) the San Francisco Deep Ocean Disposal Site; 3) the Hamilton Wetlands Restoration Project; and 4) the Montezuma Wetlands Restoration Project. These sites are already permitted or may be permitted by the start of dredging activities for the East Span Project (Caltrans, 2000).

It is possible that the excavated materials could be recycled and used as aggregate, used as borrow material to construct fill for approach ramps, trucked to a site that needs fill. It is conceivable that excavated materials could be a source of borrow for the San Francisco International Airport runway expansion if the project ever proceeds (Subrizi, 2002).

**Noise and Vibration**

There is a potential for significant noise and vibration impacts due to boring construction in areas closest to the construction. It is possible that existing structures near the entrances of the tunnels in Oakland and San Francisco could be affected by tunnel boring. However, as already noted above, the assessment of environmental issues associated with using a world class tunnel boring technology is difficult to assess and is beyond the scope of this preliminary environmental evaluation, since there has been little experience with this technology in the United States.

**Air Quality**

Typical air quality impacts due to heavy construction are described in Alternative 3, below. It is beyond the scope of this report to speculate about potential air quality impacts due to boring construction techniques.

Due to cleaner cars and trucks, regional emissions of ozone forming pollutants will continue to decline over the next twenty years. Particulate matter from entrained dust which is produced by vehicles traveling over Bay Area freeways will likely increase with additional traffic. However, improvements which reduce vehicle miles of travel compared to the baseline would have a positive impact.

The change in reactive organic gases (ROG), nitrates of oxygen (NOx), and particulate matter less than 10 microns (PM10) emissions at the regional level is less than 1%, which is not considered significant (see Table 2 at the end of this report). It is expected that this alternative, as well as the other study alternatives, have minimal impact on total regional vehicle emissions, since transbay travel accounts for just 4% of total regional travel.

**Visual**

Few visual impacts would be expected since almost all of the construction and new facilities would be located below grade. Visual impacts could occur at the entrances to the tunnels in Oakland, although these impacts would be within existing industrial and commercial areas and would not be considered significant.

**Economic Development**

Positive economic development impacts to the region would be related to improved rail access between the East Bay and San Francisco. The new tunnels could increase business and property values in areas served by the new BART and rail stations.

**Equity**

For Alternative 2, the most significant benefit is a large improvement in access to jobs by transit from East Palo Alto, Hayward, East Oakland, and Richmond because of the new transbay rail service. For example, the number of jobs accessible by a transit trip within 50 minutes from Richmond increases by 60 percent over the baseline conditions, because of planned improvements to the Bay Bridge transit system. The number of jobs accessible by transit from East Palo Alto increases by 11 percent. There are small decreases (1% to 3%) in accessibility to jobs from Bayview Hunters Point and South San Francisco. The proposed commuter rail crossing in Alternative 2 also provides significantly improved transit travel time from West Berkeley, Richmond and Martinez to downtown San Francisco (MTC, 2002).

## *ALTERNATIVE 3 - SAN MATEO BRIDGE CORRIDOR HIGHWAY IMPROVEMENTS*

**Land Use/Right of Way**

The most significant land use and right-of-way issues for this alternative would be concentrated along the I-880 freeway north of SR 92, where the freeway would be widened by one lane in each direction during Phase 2 of the project. (Phase 1 of the project involves construction of a reversible median on the high rise portion of the San Mateo-Hayward Bridge.) Portions of the existing 14-foot soundwalls along both sides of I-880 would be moved approximately 14 feet to accommodate the new lanes. Approximately 30,000 linear feet of soundwalls would be relocated, potentially affecting approximately 350 to 400 adjacent private lots, most of which are occupied by single family residences. In addition, near the I-880/SR 92 interchange, in the northwest quadrant of the interchange, the ramp would be widened to two mixed flow lanes for the

southbound to westbound movement, and the existing soundwalls would be relocated. This alternative and its likely environmental impacts are conceptually illustrated in Figure 4.

The approximately 350 to 400 residential lots that would be affected by demolition and reconstruction of sound walls for the new lanes on I-880 are located on the streets closest to the existing soundwalls between the SR 238 and SR 92 interchanges, within the unincorporated areas San Lorenzo or Hayward, or and within the City of Hayward. Many of these lots have structures, e.g., the residences themselves, garages or backyard sheds, that are located very close to the existing soundwalls. A worst case analysis would assume that most, if not all, of the residences would have to be taken to accommodate the new lane widening and soundwall construction along I-880. Many of the existing residential lots appear to have been decreased in size by the last lane widening and soundwall installation along the I-880 freeway. Based on field surveys it appears that further taking of the backyards by even 14 feet could create substandard lots and unacceptable living situations which would be at variance with zoning and building codes.

The single family residences that would be affected by the lane widening and soundwall construction are located on the following streets: Via Arroyo, Via Descanso, and Via Rincon (between Lewelling Boulevard and Hacienda Avenue); Ricardo Avenue and other courts (between Hacienda Avenue and A Street); Fuller Avenue and other courts (between A Street and Winton Avenue); Magnolia Street, Lindenwood Way, and Willamet Way (between Winton Avenue and SR 92).

Several other buildings that could be impacted by construction of the new soundwalls are located along various courts off Hathway Avenue, between Hacienda and Winton avenues. In addition, widening of the freeway would affect an Alameda County Public Works corporation yard facility and the adjacent Southgate Swim Club, near Turner Court and Kay Avenue.

As part of Phase 2 of the project, a new parallel high rise portion of the San Mateo-Hayward Bridge would be constructed, approximately 54 feet north of the existing high rise structure. Land use and right-of-way impacts would not be expected to be as significant as on the East Bay side because there is an existing wide Caltrans right-of-way north of where the existing bridge meets the land, which is now used as a maintenance yard.

**Biology**

The causeway section of the recently widened San Mateo-Hayward Bridge would be widened again under Phase 2 of this alternative, which would require the placement of additional supporting piers in the San Francisco Bay. Construction of a parallel high rise bridge would require a new footing for the 63-foot wide bridge to be placed in the Bay. Construction and placement of new bridge supports in the Bay could have potentially significant impacts to the aquatic environment, including numerous special status species.

The following discussion would also apply to Alternative 4, which involves placement of piers in the Bay or filling of wetlands.

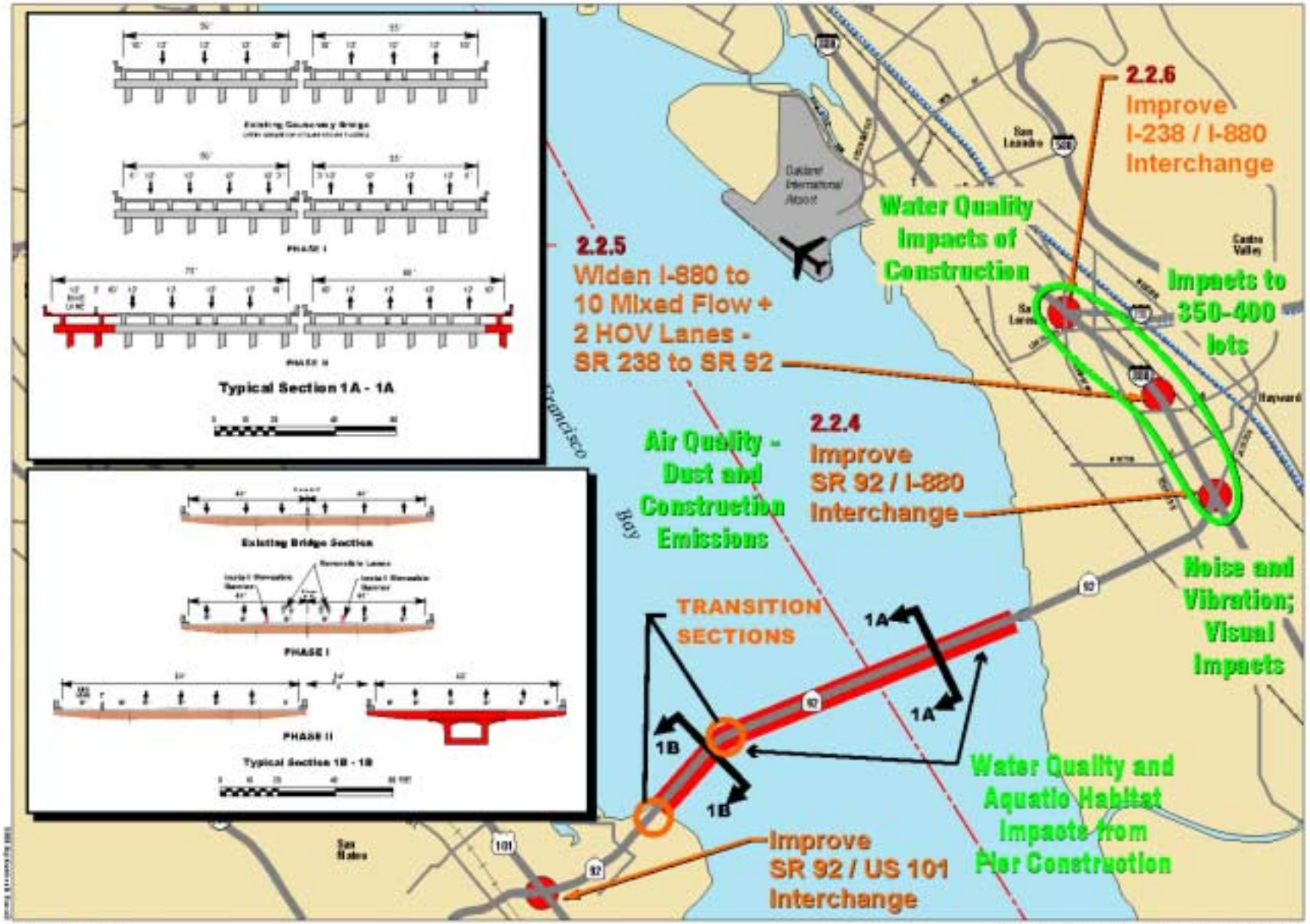


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Figure 4

**ALTERNATIVE 3**

SAN MATEO BRIDGE CORRIDOR
ENVIRONMENTAL IMPACTS

Water quality and aquatic habitat issues associated with installation of posts for the new bridge and causeway widening would be considered moderate environmental impacts. Short-term impacts of construction could be an increase in suspended silt from excavated Bay mud, and possible long-term impacts on aquatic habitat due to resuspension of toxic contaminants in dredge material. A secondary concern would be the potential for encountering contaminated dredge spoils and questions about disposal placement.

However, the adopted Final Impact Report/Statement (FEIR/S) for the San Mateo-Hayward Bridge Widening project (Caltrans, 1996) that is now under construction found limited water quality impacts on the Bay ecology and concluded that the "pile-driving during bridge construction can be expected to cause a temporary increase in turbidity. Pile-driving will minimize potential temporary impacts of sediment mobilization and turbidity."

Construction activities could affect special-status species associated with the aquatic habitat of the Bay, including several fish species and pinnipeds (seals and sea lions), as well as possible disruption to bird roosting, feeding, and resting activity on or near the proposed bridge improvements.

The biological impacts related to the placement of fill in San Francisco Bay would require precise quantification and mitigation. A discussion of fill requirements and mitigation for the related San Mateo-Hayward Bridge Widening project bridge project is included below to provide some comparison of impacts and mitigation that could be required. The adopted Final Impact Report/Statement (FEIR/S) for the project now under construction estimated the fill required to widen the causeway portion of the bridge and adopted a mitigation program. The report discussed other biological impacts related to the new causeway and concluded that the causeway widening project would not result in any significant unavoidable environmental impacts to the biology of the Bay.

The FEIR/S for the San Mateo-Hayward Bridge Widening project found the project area "does not contain breeding, wintering or foraging habitat for any candidate, proposed, or listed threatened or endangered species of animals or suitable habitat for sensitive plants." The report did state that noise associated with pile-driving may impact animals in open water adjacent to the bridge but impacts would be temporary and not adverse. Harbor seals may avoid foraging in the area during construction. The report stated the bridge deck will permanently shade approximately 36 acres of mudflat and open water habitat, which would slightly reduce the productivity of photosynthetic plankton within the shadow of the bridge. Similar impacts would be expected for the further widening of the causeway and construction of the new high rise bridge.

Under policies of the Bay Conservation and Development Commission, a permit must be secured to add fill to the Bay. Adequate mitigation must be provided based on how much "solid," "pile-supported," and "temporary" (construction period less than 180 days) fill is added. The environmental analysis for the San Mateo-Hayward Bridge Widening project found that construction of the widening along the causeway portion of the bridge would add 36 acres of pile-supported fill over Bay waters and mudflats, and between 0.19 and 0.37 acre of permanent fill to the Bay as a result of the placement of new piles.

Caltrans agreed to mitigate for impacts related to wetlands and fill by donating a 4.77-acre seasonal wetland to the California Department of Fish and Game with substantial financial contribution to enhance the parcel. Caltrans also agreed to contribute funds to the Hayward Area Recreation and Park District's marsh enhancement program, as well as in-kind contribution of staff time.

Another major environmental issue would be the possible need to fill jurisdictional wetlands to accommodate roadway widening and frontage roads at the eastern approach to the bridge during Phase II construction, depending on the detailed plans. The extent of the affected habitat would depend on the degree the existing approaches could be used for improvements and the amount of any required fill of the adjacent wetlands. Jurisdictional wetlands issues may also be triggered by the planned crossing over an existing canal in Foster City, at the western approach to bridge.

For another recent Caltrans project, the widening of Route 37 in the Vallejo area, the project was required to mitigate for the loss of wetlands and other habitat (Caltrans, 1996? undated). The highway widening requires filling of 14.6 acres (5.9 hectares) of existing seasonal wetlands. The required mitigation is to create tidal wetlands to replace lost seasonal wetlands at a mitigation ratio of 4:1, as required by the Bay Conservation and Development Commission. Tidal wetlands will be restored at a 53-acre diked former tidal marsh west of Napa River Bridge and seasonal wetlands and riparian forest will be created at the Chabot Creek site, a 5.7-acre ruderal upland site west of the Route 29 creek crossing.

The upland segments along I-880 slated for improvements are not expected to have major biological issues, since the existing urban development has low habitat values and little or no potential for occurrence of special-status species or wetlands.

**Geology**

The geological and seismic impacts associated with Alternative 3 are primarily related to ensuring that the improvements to the San Mateo Bridge are designed considering the seismic environment of the Bay Area. The active Hayward, San Andreas, and Calaveras faults are all located less than 20 miles from the project area. The components of this alternative do not cross the known active traces of these faults. Any improvements would need to conform to latest earthquake design standards.

**Water Quality / Dredging**

As already noted above for Alternative 2, preparation of a Storm Water Pollution Prevention Plan (SWPPP) would be required for approval of any construction related to the alternative, which must be in compliance with the National Pollutant Discharge Elimination System (NPES) permit issued by the San Francisco Regional Water Quality Control Board for Caltrans projects in the Bay Area. The SWPPP would specify storm water protection measures during construction and address the discharge of materials other than storm water.

Dredging could be required if floating barges are used to construct the new high rise bridge or the widening of the existing causeway. Much of the work area is in an intertidal and shallow subtidal environment, and the water is not deep enough for barges to float. For the recent widening of the causeway, Caltrans decided to reject the use of floating barges and require “over the top” construction, even though it is slower and more costly. It is assumed that significant amounts of dredging of Bay mud would not be required for this alternative, since the use of floating barges could be avoided.

**Noise and Vibration**

Noise and vibration effects of new construction and new lane widening would be most concentrated on existing residences and other land uses along I-880, between SR 238 and SR 92. Existing high soundwalls would be demolished and new high soundwalls would be constructed closer to the existing uses. As noted above, approximately 30,000 linear feet of soundwalls would be relocated, potentially affecting approximately 350 to 400 adjacent private lots.

The following discussion of typical noise and vibration impacts would also apply to the other alternatives where freeway construction or modification would occur in close proximity to existing land uses.

Caltrans and Federal Highway Administration require the consideration of noise abatement when existing levels exceed 67dBA for residential or other sensitive land uses adjacent to planned improvements. Constructing high 14-foot soundwalls to break the line of sight for truck stacks must provide a minimum 5 decibel reduction in noise levels. It is assumed that the existing 14-foot soundwalls along I-880 would be replaced with new 14-foot soundwalls closer to the existing residences and other land uses. Outdoor noise levels behind the existing soundwalls are assumed to be in excess of 67dBA. The projected outdoor noise levels behind the new soundwalls would be greater than that already experienced by residents behind the existing soundwalls since two lanes of traffic would be added to I-880 under this alternative.

The Final Impact Report/Statement (FEIR/S) for the San Mateo-Hayward Bridge Widening project (Caltrans, 1996) found that existing outdoor noise levels at that time along Route 92 in Hayward exceeded the Caltrans noise abatement criteria of 67decibels (dBA), including some locations behind existing soundwalls. The widening of the San Mateo Bridge causeway section now under construction is expected to increase noise levels from 1 to 4 dBA adjacent to the roadway, due to increased traffic. A 5 dBA change is considered to be noticeable and require mitigation.

Temporary noise impacts from construction activities would also directly affect existing residences and land uses adjacent to the I-880 and SR 92 freeway planned for improvements. Typical construction noises generated by heavy equipment required for the demolition of the soundwalls and installation of the new lanes along I-880 would be in the range of 85 to 105 dBA at 50 feet (see Table 1). These estimates are consistent with the Transportation Research Board data that indicates the typical noise level generated on a construction site could reach 85 dBA at a distance of 15 meters (50 feet). Noise levels generated by construction equipment (or by any "point source") decrease at a rate of approximately six decibels (dB) per doubling of distance away from the reference distance of 15 meters (50 feet).

Table 1: Typical Noise Levels for Construction

| Construction Equipment Noise Source | Typical Noise Level (dBA) (distance from source) | | |
|---|---|---|---|
| | 50 feet | 100 feet | 400 feet |
| Pneumatic tools | 85 | 79 | 67 |
| Surface sawing/jackhammer | 70-95 | 64-89 | 52-77 |
| Dump truck | 88 | 82 | 70 |
| Concrete mixer (truck) | 85 | 79 | 67 |
| Scraper | 88 | 82 | 70 |
| Bulldozer | 87 | 81 | 69 |
| Paver | 89 | 83 | 71 |
| Pile driver | 90-105 | 84-99 | 72-87 |
| Backhoe | 85 | 79 | 67 |
| Generator | 76 | 70 | 58 |
| Portable air compressor | 81 | 75 | 63 |

Typical noise mitigation programs would require that all construction equipment conform to the provisions in the latest edition of Caltrans' Standard Specifications to minimize noise from construction activities, such as maintaining equipment mufflers in proper operating order. The contractor would be required to comply with local noise control ordinances to the extent practicable. Caltrans or the lead could be required to investigate the possibility of limiting the hours for pile driving to reduce the construction noise impacts to nearby residents. Caltrans could also require contractors to install and use sound-attenuating fabric shrouds around the hammer/pile impact area of pile driver equipment during pile driving to the extent possible to reduce noise levels in sensitive areas and, where practicable, require that pile holes be pre-drilled to reduce impacts of pile driving (Caltrans, 2000).

Vibration levels from construction activities such as pile driving for the new freeway and approach ramps, and dismantling of existing soundwalls along I-880, have the potential to cause building damage under certain circumstances. There are no federal or State standards for vibration levels. However, Caltrans has measured vibrations generated during various construction activities on projects throughout the state. Pile driving has frequently been done at distances of 8 to 15 meters (25 to 50 feet) from buildings without causing damage such as lateral movement from soil. Pile driving could produce ground-borne vibration levels that would be

perceptible to humans within approximately 200 meters (660 feet) of the pile driving activity. Buildings that are more than 15 to 30 meters (50 to 100 feet) from pile driving would not be damaged (Caltrans, 2000).

Mitigation could be required to ensure that vibration from pile driving does not result in damage to residential or other structures within 50 feet. Typical mitigation would be to monitor nearby buildings for damage as a result of construction activities, including the possible use of vibration-measuring devices on the buildings. Caltrans or the lead agency could photographically document the condition of these buildings prior to the start of construction to establish the baseline condition for assessing damage. Any damage to the buildings resulting from construction activities would be repaired in accordance with applicable standards for rehabilitation (Caltrans, 2000).

**Air Quality**

The following discussion of air quality impacts would also apply to the other alternatives where freeway construction or other heavy construction activities would occur in close proximity to existing land uses.

Localized air emissions would be generated by construction equipment along the length of the I-880/SR 92 corridor. Exhaust and odors from trucks and other heavy construction equipment would contain hydrocarbons, nitrogen oxides, carbon monoxide, and particulate matter. Windblown dust from grading, excavation, and hauling activities could be extensive, even with typical mitigation such as daily or even hourly watering of exposed areas. The nearest residences to the construction along I-880 and SR 92 would experience short-term dust levels that could be considered annoying and could trigger complaints.

Measures to reduce emissions during construction, as specified in Caltrans' Standard Specifications, include the following:

- Watering exposed soil surfaces;
- Covering trucks transporting dust-producing material leaving or entering a construction site;
- Reducing construction vehicle travel speeds on unpaved surfaces;
- Maintaining equipment per manufacturers' specifications; and
- Conforming with all air pollution rules, regulations, ordinances, and statutes.

Based on the requirement that these measures be included in all contract specifications, no further mitigation has been proposed for a similar large scale bridge construction project, the seismic upgrade of the East Span of the Bay Bridge (Caltrans, 2000).

Due to cleaner cars and trucks, regional emissions of ozone forming pollutants will continue to decline over the next twenty years. Particulate matter from entrained dust which is produced by vehicles traveling over Bay Area freeways will likely increase with additional traffic. However, improvements which reduce vehicle miles of travel compared to the baseline would have a positive impact.

The change in ROG, NOx, and PM10 emissions at the regional level is less than 1%. These results are not considered significant (see Table 2 at the end of this report).

**Visual**

Visual impacts of the alternative would be related to construction of new soundwalls along I-880 and construction of a new parallel high rise bridge on SR 92. Views of existing residents and businesses along I-880 would be affected by the construction soundwalls closer to existing structures. Construction of a new high rise bridge could affect some existing views of residents, workers, and recreational trail users along the San Francisco Bay shoreline near Foster City.

**Economic Development**

The alternative would not create new access to significant amounts of undeveloped or underdeveloped lands planned for commercial or industrial growth. The alternative could contribute to overall economic vitality by improving mobility in the transbay corridor. However, the alternative could have significant localized negative impacts as hundreds of existing structures, including single family, may be affected in San Lorenzo and Ashland (Hayward).

**Equity**

For Alternative 3, the number of jobs that are accessible within a 40 to 60 minute commute by drive alone car, carpool, or transit for the disadvantaged communities does not significantly change. However, the number of jobs accessible by carpool from the Richmond and Hayward communities does increase significantly (9% to 15%) with Alternative 3.

Alternative 3 could result in the relocation of 30,000 linear feet of soundwalls in the unincorporated communities of San Lorenzo and Ashland, in the San Leandro- Hayward area. The Metropolitan Transportation Commission has not identified unincorporated San Lorenzo as one of the communities of concern within the Bay Area, but has identified a portion of Hayward. Some of the neighborhoods that would experience loss of single family residences due to the relocation of soundwalls along I-880 may include low income or minority residents.

## *ALTERNATIVE 4 - NEW MID-BAY BRIDGE - I-380 TO SR 238*

**Land Use/Right of Way**

The construction of a new freeway link between the existing SR238/I-880 interchange and the beginning of a new mid-Bay bridge could cause very significant land use and right-of-way impacts to existing neighborhoods in the City of San Leandro and the unincorporated communities of San Lorenzo (west of I-880)and Ashland (east of I-880). The connection between the existing I-238 and the new freeway bridge would be accomplished by a tunnel constructed with a combination of cut-and-cover and boring techniques. The most significant impacts would be to several major commercial structures and apartment buildings west of the

existing SR 238/I-880 interchange. This alternative and its likely environmental impacts are conceptually illustrated in Figure 5.

The alignments of the proposed freeway connectors would require some cut-and-cover excavation, or cut/fill. The connectors would directly affect most structures of a major shopping center (Greenhouse Marketplace) in the City of San Leandro at Lewelling Boulevard/Washington Avenue. The main tenant in the northern portion of the shopping center (Safeway) would be directly affected by cut or fill. Tenants in the southern portion of the shopping mall would be forced to relocate, and tenants in two other separate buildings within shopping center site may also require relocation.

West of the shopping center, at the southeastern quadrant of the Lewelling/Washington intersection, two large apartment buildings and a Walgreens drug store would require removal. The two-story apartment buildings contain an estimated 100 units. Connecting ramps between I-880 and the new freeway could also directly impact a new multiple family structure currently under construction on Embers Way south of Lewelling Boulevard.

On the east side of I-880, construction of the northbound connector to the new freeway would take at least one commercial structure at Lewelling/Hesperian and could also require the removal of numerous single family homes along Via Arroyo adjacent to the existing soundwall.

The new freeway would descend into a tunnel east of the San Lorenzo Creek flood control channel, and west of the Walgreens drugstore on Washington Avenue. The tunnel would emerge within the channel at a point just east of the railroad tracks. The new freeway tunnel would be constructed underneath the channel with state of the art boring technology that theoretically would not affect the waterway or structures within the area. Thus, the residences along Vining Drive in San Leandro (north side levee) and along Via Hermana and Via Bregani south of the San Lorenzo Creek flood control channel should not be affected by construction or operation of the freeway. However, as noted above under the discussion of Alternative 2, the environmental issues associated with using the new tunnel boring technology are difficult to assess and are beyond the scope of this preliminary environmental evaluation.

As noted above, the tunnel would emerge east of the former SP railroad tracks, near the field behind Challenger School, and would become a separated, elevated causeway. Three lanes each would be constructed with soundwalls on single piers on top of the levees along each side of the flood control channel. Construction of this portion of the elevated freeway could have direct impacts to some of the single family residences located adjacent to the northern and southern channel levees at the point east of the railroad tracks. Some of the homes along the north levee appear to be located very close to levees of the channel. The top of the levees is fairly narrow (approximately 50 feet), and are gravel-covered with little vegetation. The levees are not open to public access. Construction of three directional lanes on an elevated freeway supported by a single pier on the top of the levees could impact approximately 20 homes along the north levee and 10 homes along the south levee.

West of the railroad tracks, the recently constructed Heron Bay subdivision is located north of the channel. The flood channel west of the railroad tracks is wider than the channel east of the tracks. It appears the nearest homes are not located as close to the top of the levee as the older homes east of the railroad tracks. Land uses located south of the channel are industrial and would not be affected directly.

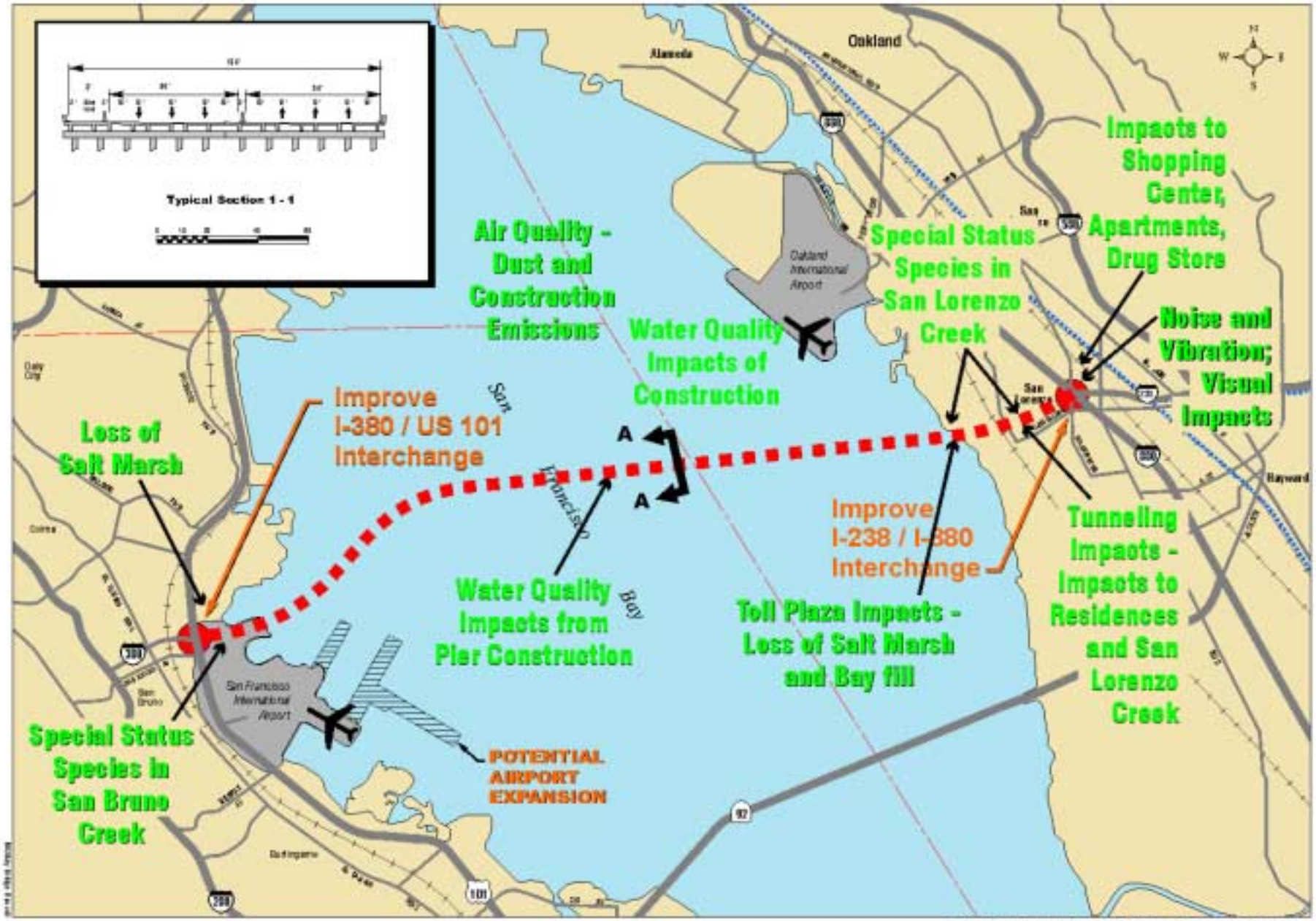


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**Figure 5**

**ALTERNATIVE 4**

**MID-BAY BRIDGE - SR 238 to I-380**

**ENVIRONMENTAL IMPACTS**

Potential mitigation for the impacts to the single family homes north and south of the channel where the tunnel emerges would be to place the piers which support the three directional lanes of the new freeway within the channel itself, away from the levees and residences. It is unknown if this design would seriously compromise the flood control function of the San Lorenzo channel.

The toll plaza for the new mid-Bay bridge would be located on tidal lands west of the railroad tracks and north of the San Lorenzo Creek channel. It appears that there is not enough land between the railroad tracks and the edge of Bay mudflats to locate the toll plaza and the bridge connection without requiring some fill of the Bay. The toll plaza design and operation would be similar to the existing plaza at the San Mateo Bridge. It would include 14 lanes and be approximately 500 feet wide. At least 15 acres or more of salt marsh habitat would be affected.

The National Wetland Inventory published by the U.S. Fish and Wildlife Service identifies the salt marsh lands north of the creek channel as estuarine intertidal emergent wetlands that are irregularly flooded (E2EMP) (USFWS, 2002).

The alignment of the new bridge across the San Francisco Bay is north of where new runaways are proposed by San Francisco International Airport, and the new bridge has been located so that it avoids the approach zones for aircraft operations. Thus, it is assumed that no significant land use impacts would be expected for the water crossing portion of the bridge.

Land use and right-of-way impacts would not be expected to be significant near San Francisco International Airport, where the new bridge would connect with the existing I-380 freeway.

**Biology**

Construction of a new 126-foot wide bridge, elevated 20 feet above the Bay, would require the placement of numerous supporting piers in the San Francisco Bay. Construction and placement of new bridge supports in the Bay would have potentially significant impacts to the aquatic environment, including numerous special status species.

As with the previous Alternative 3, major water quality and aquatic habitat issues would be associated with the installation of posts for the new bridge. The short-term construction impacts are related to a potential increase in suspended silt from excavated Bay mud, and possible long-term impacts on aquatic habitat due to resuspension of toxic contaminants in dredge material. The same secondary concern is related to contaminated dredge spoils and questions about disposal placement.

Construction of the new bridge would likely require fill within jurisdictional wetlands and waters of the Bay to accommodate bridge footings and approaches. There could also be extensive impacts at the western and eastern approaches to the new bridge. Near San Francisco International Airport, the potential fill impacts could affect an estimated 18 acres of sensitive salt marsh habitat along North Access Road at the western

approach. Possible mitigation requirements for fill of wetlands have been discussed above under Alternative 3.

On the east, the wetlands at the mouth of San Lorenzo Creek would be affected by tunnel excavation and bridge construction. It is difficult to estimate how much salt marsh habitat could be affected due to engineering issues concerning how the tunnel would transition to a possible toll plaza and onto the new mid-Bay Bridge. It is estimated that at least 15 acres or more of salt marsh habitat could be affected. Depending on final design, construction could also affect two major waterways: the San Bruno Creek channel at the western bridge approach and the San Lorenzo Creek channel at the eastern bridge approach.

Thus, potentially significant impacts on special-status species could occur, related to the aquatic habitat of the Bay and adjacent wetlands, and the San Bruno and San Lorenzo Creek channels. These species include several fish species, birds, small mammals, and pinnipeds.

Similar to the other alternatives, the upland segments of the construction areas away from creek channels are not expected to have major biological issues due to their location in existing urban areas with low habitat values and little or no potential for occurrence of special-status species or wetlands.

**Geology**

The Hayward, San Andreas, and Calaveras faults are all located less than 20 miles from the project area. The components of this alternative do not cross the known active traces of these faults. Any improvements would need to incorporate the latest earthquake design standards.

**Water Quality/Dredging**

Construction and placement of new bridge supports in the Bay would have potentially significant impacts on water quality during construction, if not adequately mitigated. Typical water quality impacts and mitigation through preparation of a Storm Water Pollution Prevention Plan have already been discussed above in Alternative 3.

Construction of the tunnel under San Lorenzo Creek using state of the art boring technology would generate a significant amount of excavated spoils materials. Issues related to storing and disposal of the materials would be similar to Alternative 2, but on a much smaller scale. It is possible that excavated materials could be used as fill for the toll plaza and for improvements at the I-880/I-238 interchange.

**Noise and Vibration**

Noise and vibration effects of new construction would be most concentrated near existing commercial and residential structures at the existing SR 238/I-880 interchange. Construction of the new freeway and any accompanying soundwalls would generate significant temporary noise and vibration, and could affect

numerous residents and businesses in the area. Typical noise and vibration impacts and mitigation for heavy construction have already been discussed above in Alternative 3.

**Air Quality**

Localized air emissions, including particulate matter, would be generated by demolition of existing structures, land clearing and grading, and construction equipment used to build the mid-Bay bridge in the San Leandro and San Lorenzo area, and near the San Francisco International Airport. Typical air quality impacts and mitigation for heavy construction has already been discussed above in Alternative 3.

Due to cleaner cars and trucks, regional emissions of ozone forming pollutants will continue to decline over the next twenty years. Particulate matter from entrained dust which is produced by vehicles traveling over Bay Area freeways will likely increase with additional traffic. However, improvements which reduce vehicle miles of travel compared to the baseline would have a positive impact.

The change in ROG, NOx, and PM10 emissions at the regional level is less than 1%. These results are not considered significant (see Table 2 at the end of this report).

**Visual**

Visual impacts of the alternative would be related to the construction of new freeway connectors at the existing SR 238/I-880 interchange and construction of a new bridge across the Bay.

Views of San Francisco Bay seen by existing residents and businesses along the Peninsula and East Bay would be changed, perhaps significantly from some areas, with the addition of a new bridge.

**Economic Development**

The alternative would not create new access to significant amounts of undeveloped or underdeveloped lands planned for commercial or industrial growth. The alternative could contribute to overall economic vitality by improving regional mobility. However, the alternative could have significant localized negative impact as dozens of existing structures, including residences and businesses, may be affected in San Leandro, San Lorenzo and Ashland.

**Equity**

For Alternative 4, the most significant benefit is an increase in the number of jobs that are accessible within a 40 to 60 minute commute by drive alone car, carpool, or transit for some disadvantaged communities, such as South San Francisco, Hayward, East Oakland, West Oakland and Richmond. For example, the number of jobs accessible by a solo auto or carpool increases by 11 to 21 percent for South San Francisco residents and even more for West Oakland and Richmond residents. Consistent with these results, Alternative 4 decreases transit travel time from a number of the target communities to job centers. For example, transit travel time

from Fremont, Newark and Hayward to SFO decreases by more than 15 minutes; and transit travel time from several communities to downtown San Mateo and downtown Palo Alto decreases by 10 to 15 minutes.

Equity and environmental justice impacts could also be related to construction of the new freeway through the unincorporated community of San Lorenzo. The Metropolitan Transportation Agency has not identified San Lorenzo as a disadvantaged community within the Bay Area; however, some of the neighborhoods that would be affected by the construction and operation of the new freeway link between SR 238 and the new mid-Bay Bridge may be considered disadvantaged.

## *ALTERNATIVE 5 - DUMBARTON RAIL BRIDGE*

### Land Use/Right of Way

Under this alternative, the Dumbarton Bridge rail bridge would be restored and track improvements would be completed in five locations in Hayward, Fremont, and Newark. All but one of the track improvements would be associated with the "basic" level of planned rail service. One of the improvements, construction of the rail connection in the Niles Junction area of Fremont is associated with provision of "expanded" rail service to Tracy. This alternative and its likely environmental impacts are conceptually illustrated in Figure 6.

In Hayward, a new rail connection of approximately 1,400 feet would link the former Western Pacific and Southern Pacific (now both Union Pacific) lines just north of the Bay Area Rapid Transit rail yard shops. The proposed rail connecting track would be constructed within the existing rail right-of-way and would not affect any adjacent properties or structures.

In Fremont, four new rail connections would be constructed to create better links between the former Western Pacific and Southern Pacific lines west of Niles Junction. Three of the new rail track connections are within or near Alameda Creek Flood Control Channel and the Alameda Creek Quarries, a series of former quarries that are now filled with water and are managed as a regional park. Each of the four rail links could have significant land use impacts.

A 3,300-feet rail connection would be constructed between Niles Junction and the Southern Pacific line near the existing Union Pacific rail station. The rail line would be constructed over one of the quarry lakes included in the regional park. A 2,000-foot long rail link would smooth out the curve connecting the two rail lines west of the existing UP station. This new rail line would bisect an existing heavy industrial development and the Alameda County Corporation Yard. Several large industrial structures would require removal.

A new 4,500-foot long rail connection would be constructed to link the north-south Western Pacific and east-west Southern Pacific lines east of Paseo Padre Parkway. The aerial connecting track would span portions of three quarry lakes in the regional park, the Alameda Creek Flood Control Channel, and a recently constructed single family subdivision (Riverwalk). The aerial rail link would affect the western portion of the subdivision, possibly requiring the removal of 20 to 30 homes.

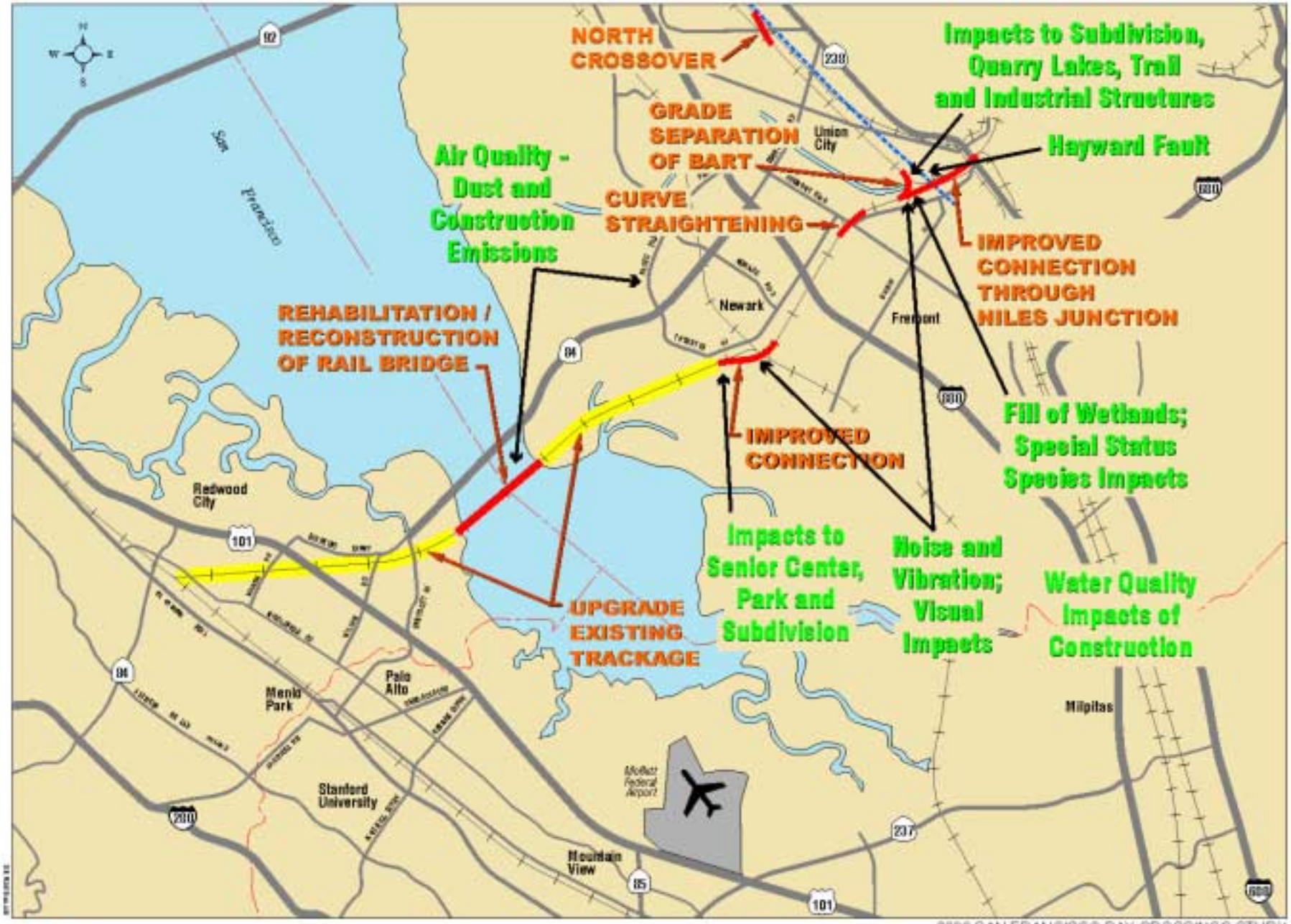


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Figure 6

**ALTERNATIVE 5**

RECONSTRUCTION OF DUMBARTON RAIL BRIDGE WITH COMMUTER RAIL SERVICE
ENVIRONMENTAL IMPACTS

The fourth link in Fremont would widen the radius of the Southern Pacific rail line near the Centerville ACE rail station at the intersection of Peralta Boulevard (State Route 84) and Fremont Boulevard. The new track would cut through a private commercial property, although land use impacts on existing structures may be limited since a portion of the properties consist of large parking lots and most of the structures are already set back from the railroad tracks. However, the nearest parking lot that would be directly affected was recently observed being graded, which may be an indication of new building construction.

There are also major potential land use and right-of-way impacts in the area of Newark near the City Corporation Yard where two existing wye rail junctions would be modified to support speeds necessary for commuter rail service. One of the two wye junctions would be bypassed by one of two possible track alignments. One alignment would require an approximately 7,500-foot long right-of-way that would pass through an existing senior citizens center and adjacent city park (Ash Street Park). The city park consists of an open grassy field and basketball courts. The alignment follows a former rail line connection that cuts through the area, so land use impacts on existing structures would be minimized. However, several large industrial structures would require removal south of the City Corporation Yard and along Enterprise Drive. In addition, a new subdivision of single family homes is under construction near Enterprise Drive/Wells Avenue.

Possible mitigation for this possible alignment would be to relocate the senior citizens center elsewhere in the city and contribute to the development of a new city park. The alignment could also possibly be refined to avoid the new subdivision of homes.

The second possible alignment would require a shorter new right-of-way (approximately 4,500 feet) but would have much more significant land use impacts than the other alignment. The alignment would cut diagonally through the middle of a dense residential neighborhood bordered by Clark Avenue, Cherry Street, and Central Avenue. Approximately 50 single family homes would be taken, plus portions of a major four-story apartment complex along Sycamore Street.

**Biology**

Major water quality and aquatic habitat issues could be associated with the removal of the burned section of the closed Dumbarton Railroad Bridge and installation of new posts for the rebuilt section of the bridge. Short-term impacts would be an increase in suspended silt from excavated Bay mud, and possible long-term impacts on aquatic habitat due to resuspension of toxic contaminants in dredge material. Secondary concerns are the potential for contaminated dredge spoils and questions over disposal placement.

As with Alternatives 3 and 4, major impacts could be anticipated related to the placement of fill in the Bay for new railroad bridge footings and approaches. However, it is assumed that only a limited number of new railroad bridge supports would be required to replace the burned western portion of the bridge. The existing railroad tracks that pass through wetlands and extensive salt marsh habitat between Dumbarton Point and Newark Slough, and through the diked wetlands along the bayfront in Menlo Park and East Palo Alto would not be modified. Thus, no direct biological impacts would be expected unless construction access is required into the adjacent wetlands.

Biological impacts could occur near the proposed rail connections over Alameda Creek, and at construction sites near the lakes of the Alameda Creek Quarries Park, including impacts to special-status species associated with aquatic habitat and adjacent wetlands (steelhead trout, California red-legged frog, and burrowing owl, among others). If piers are constructed in wetland areas or in existing park lakes, mitigation for fill would be required as discussed already above in Alternatives 3 and 4.

Construction sites in upland areas away from marshland, creek channels, and quarry lakes are not expected to have major biological issues since the developed areas have low habitat values and little or no potential for occurrence of special-status species or wetlands.

**Geology**

The Hayward Fault passes through the Fremont Niles District and fault rupture could therefore occur, affecting the new rail tracks in that area. In addition to fault rupture, a seismic event along any of the regional faults would result in seismic shaking to various degrees, depending on the magnitude of the earthquake at any of the faults. Any improvements would need to consider fault rupture, the design earthquake, and the associated effects to the improvements. Any improvements would need to incorporate the latest earthquake design standards.

**Water Quality/Dredging**

Typical water quality impacts and mitigation through preparation of a Storm Water Pollution Prevention Plan have already been discussed above in Alternative 3.

**Noise and Vibration**

The greatest potential for locally significant noise and vibration impacts would be generated by construction of new tracks in Newark and Fremont close to existing structures and neighborhoods. Typical noise and vibration impacts and mitigation for heavy construction have already been discussed above in Alternative 3. In addition, the operation of trains on the reconstructed bridge would have noise and vibration impacts along the tracks when the tracks are in close proximity to sensitive receptors.

**Air Quality**

Typical air quality impacts and mitigation for heavy construction have already been discussed above in Alternative 3. The change in ROG, NOx, and PM10 emissions at the regional level is less than 1%. These results are not considered significant (see Table 2 at the end of this report).

**Visual**

Potentially significant visual impacts could be caused by construction of the aerial rail tracks over the Alameda Creek channel in Fremont. These aerial tracks could directly affect scenic views of the creek

corridor and associated lakes of the Alameda Creek Quarries Park. The visual and recreation experience of users of the park and the pedestrian/bike trail along Alameda Creek could be significantly degraded.

**Economic Development**

The alternative could have a positive impact by improving accessibility in the corridor.

**Equity**

The most significant benefit for communities of concern for Alternative 5 is a large increase in the number of jobs that are accessible by transit from East Palo Alto, due to the construction of the new commuter rail on the Dumbarton corridor. The number of jobs accessible by a transit trip of 40 minutes or less for East Palo Alto residents increases by 71 percent. This alternative also results in reduced transit travel time from most of the communities of concern to employment centers in Redwood Shores and downtown Palo Alto.

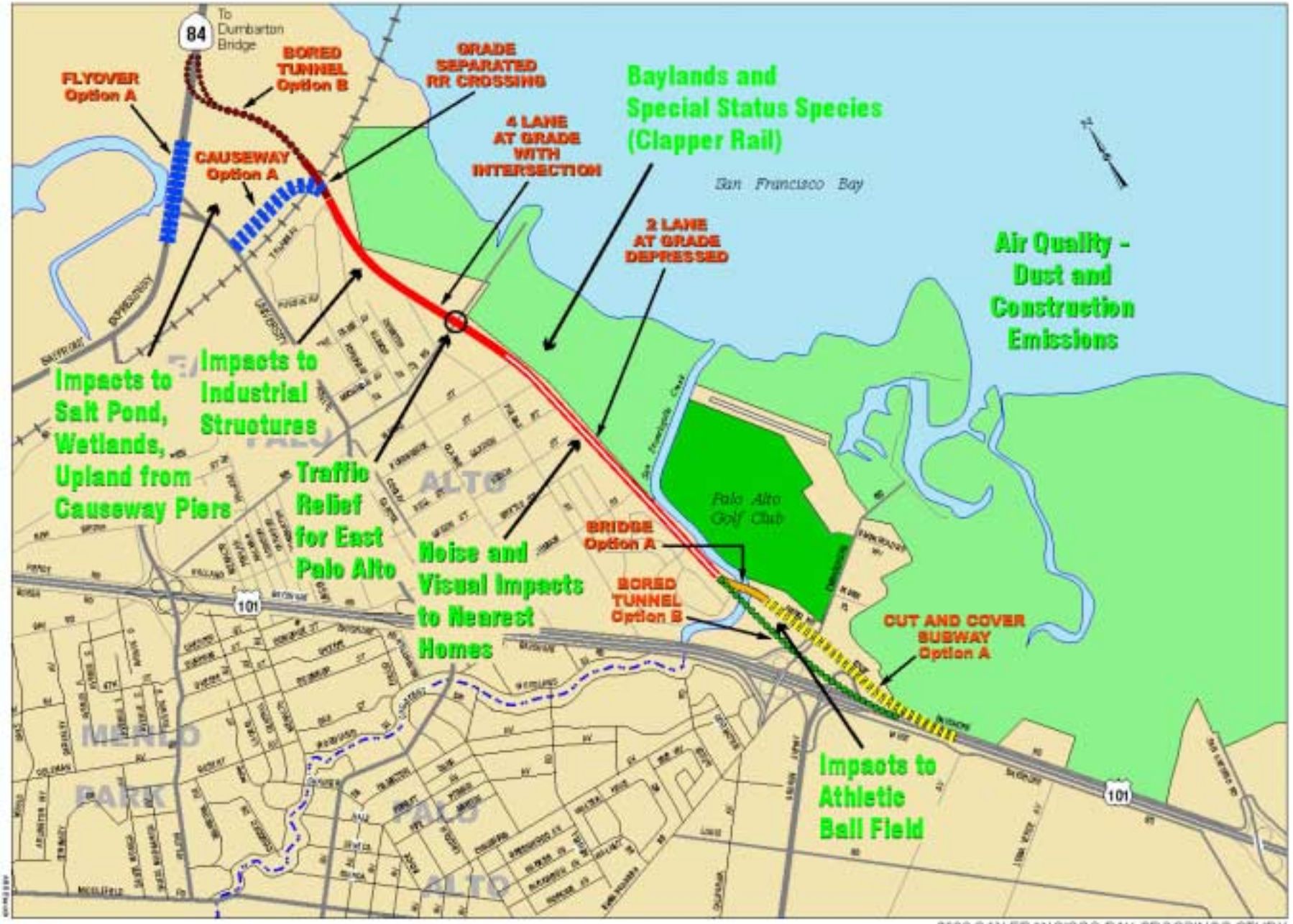
### *ALTERNATIVE 6 - DUMBARTON BRIDGE CORRIDOR HIGHWAY IMPROVEMENTS*

**Land Use/Right of Way**

The alternative includes construction of a new southerly approach road to the Dumbarton Bridge which would trigger major land use and right-of-way impacts on open space and urban lands within the cities of Menlo Park, East Palo Alto, and Palo Alto. The land use impacts include loss of several commercial and residential structures. The proposed Bypass would skirt diked marshlands along San Francisco Bay that are managed by the Midpeninsula Regional Open Space District and the City of Palo Alto. This alternative and its likely environmental impacts are conceptually illustrated in Figure 7.

Southeast of Route 84, there are two possible alignments for the first segment of the new road. One proposed alignment (Option A) would begin at an intersection along University Avenue just north of the existing grade crossing with the former Southern Pacific Railroad branch line – this alignment would be constructed as an aerial causeway traversing east parallel to the railroad tracks through the Peninsula Sportsmen's Club property, owned by the San Francisco Public Utilities Commission (SFPUC). The Sportsmen's property is a former skeet range and is undergoing remediation for removal of lead and related contaminants associated with the site's previous use as a firing range.

The proposed road would cross over the existing SFPUC Hetch Hetchy water pipelines near where the elevated pipelines enter the ground. The road would cross over the pipelines, a pump house, and the Southern Pacific (now Union Pacific) railroad tracks via a grade-separated 750-foot long bridge (the railroad tracks are not currently used since the rail bridge burned, but the bridge and tracks could be rebuilt under Alternative 5). This portion of the causeway through the SFPUC property would affect approximately 3.2 acres of habitat lands that are considered wetlands and uplands. The 3.2 acre figure is a conservative estimate assuming a shading impact to the entire 100-foot right-of-way although construction of piles or piers supporting the causeway would affect much less wetland habitat.




2000 SAN FRANCISCO BAY CROSSINGS STUDY

Korve Engineering

Figure 7

**ALTERNATIVE 6**

**DUMBARTON BRIDGE CORRIDOR HIGHWAY IMPROVEMENTS ENVIRONMENTAL IMPACTS**

The causeway would then turn south, bisecting an open area of wetlands between the existing homes of East Palo Alto and the diked marshlands of the Ravenswood Open Space Preserve. The 370-acre Ravenswood Preserve is managed by the Midpeninsula Regional Open Space District and is open for hiking along the levees of the former salt pond. A narrow slough surrounds the Ravenswood Preserve. The property line of the Preserve goes only west of the diked levee to the tidal slough, which is a small ditch in this location. Two parcels between the Preserve and the East Palo Alto homes would be affected by the causeway alignment. An approximately seven acre triangular-shaped parcel immediately south of the railroad tracks is owned by the City and County of San Francisco. A much larger approximate 29-acre parcel to the south is owned by Facciola Meats. The Facciola Meats parcel is proposed for a development project on the upland portion of the parcel, which is approximately 10 acres. The remainder of the parcel, composed of wetlands, is proposed for open space (Woods, 2002).

The causeway would be constructed through the open space/wetlands, affecting approximately 3.2 acres of wetlands; again, assuming the worst case with shading impacts, Construction of piers or columns for the roadway footing would directly affect a much smaller area of wetlands. Option A would also include a "fly-over" for through traffic along State Route 84 at University Avenue, requiring minor widening of the roadway for about 750 feet to either side of the existing intersection.

The other proposed alignment (Option B) would utilize a bored tunnel to avoid environmentally sensitive baylands and existing facilities including a large salt pond owned and operated by Cargill Salt Company for salt production, wetlands within a tract owned by Hetch Hetchy, other wetlands in the vicinity of the Ravenswood Open Space Preserve; and above grade facilities including the Hetch Hetchy aqueduct and former Southern Pacific rail line connecting to the Dumbarton rail bridge. Option B would connect to the same 4-lane surface roadway traversing through existing open space and industrial lands in East Palo Alto.

While both alignments would avoid the Cargill salt pond, Option A would have greater impacts to wetlands and upland habitat due to the construction of columns and a suspended roadway across sensitive areas. Option A would also be elevated above the baylands adjacent to existing residential areas of East Palo Alto. In Option A, a total of about 6.4 acres of habitat, composed mostly of wetlands would be affected by the causeway, assuming that no portion of the slough around Ravenswood would be directly impacted. There could also be minor impacts and loss of habitat due to fill in the vicinity of the touch-down points for the causeway and Route 84 fly-over structures.

Southeast of Route 84, there are two possible alignments for the first segment of the new road. One proposed alignment (Option A) bisects a large salt pond owned and operated by Cargill Salt Company for salt production. The four-lane Bypass road, constructed as a causeway with a right-of-way of up to 100 feet, would result in the loss of approximately 3.4 acres of salt pond habitat. A second possible alignment would skirt around the salt pond by using the existing University Avenue alignment to a point just before the railroad tracks. The alignment would then turn east and parallel the railroad through the Peninsula Sportsmen's Club property, owned by the San Francisco Public Utilities Commission (SFPUC). The second possible alignment would avoid the Cargill salt pond but would result in more loss of wetlands and upland habitat within the SFPUC property, than the first alignment.

Beyond Bay Point Road, the new road would change from four lanes to two lanes. The alignment would then bisect the Ravenswood Business Park, a partially developed concentration of industrial park buildings near Bay Road. The road would be two lanes wide beyond Bay Road. At least two major structures and assorted auto wrecking and equipment storage yards within the business park would require removal.

South of the business park, near the end of Runnymede Street, the alignment directly impacts four homes currently under construction and a portion of the East Palo Alto Charter School. The new facility could be undergrounded in this section to avoid these uses.

The two lane road then parallels the diked levee of the Palo Alto Baylands Nature Preserve. This portion of the Baylands (the Faber-Laumeister property) is owned by the City of Palo Alto, although it is within the City of East Palo Alto. The property, along with the remainder of the Palo Alto Baylands Nature Preserve, is co-managed by the City of Palo Alto and the U.S. Fish and Wildlife Service to ensure protection of endangered species. The Baylands are not part of the Don Edwards San Francisco Bay National Wildlife Refuge, although National Refuge signs have been posted in the area.

The Faber-Laumeister property is one of the last remaining locations where California clapper rails, a federal endangered species, are found. There are approximately 500 clapper rails remaining and many of them are at this location. There are no plans to allow recreational use of the Faber-Laumeister property because of the presence of clapper rail and because of safety issues related to airplanes approaching the Palo Alto Airport (Barton, 2002).

The rough levee trail around the property, which is immediately adjacent to the proposed Bypass alignment, is signed and a portion of it is open to the public. It is a designated portion of the San Francisco Bay Trail. The northbound trail ends at a point near the East Palo Alto Charter School.

There is an approximate 1,750-foot gap in the trail between this point and Bay Road. There are at least three private parcels that control access to the dike in this area. PG&E owns land immediately south of Bay Road. Aventis, a chemical company, owns property next to PG&E and a third owner, Torres, owns undeveloped property near the end of Garden Street. Aventis is negotiating access to the dike to complete the trail to Bay Road with the other private owners (Woods, 2002). Aventis CropScience (formerly Rhone-Poulenc) is the company that has restored the Ravenswood Preserve as part of its remediation program for its Bay Road industrial site.

The two lane alignment would require a right-of-way of approximately 54 feet, assuming no fill, within the land between the diked trail of the Baylands and the nearest homes of East Palo Alto. The lands south of Bay Road are in private ownership, as noted above, but the land further south near San Francisquito Creek is owned by the City of Palo Alto. The proposed alignment passes behind Martin Luther King Park and around an existing flood control pond, near the dead-end of Hibiscus Street.

At this point, the road passes to the east of San Francisquito Creek and the trail passes over the creek to parallel the Palo Alto Municipal Golf Course. The proposed Bypass alignment skirts the edge of a neighborhood of single family homes. It appears there is enough land between the creek and the nearest homes along Camellia Drive and Jasmine Way to construct the road without taking any homes. Approximately 40 homes located immediately adjacent to the alignment would be affected by the new roadway. It is assumed that soundwalls constructed along the new road could mitigate some of the noise impacts to adjacent homes.

A mitigation to avoid impacts to the homes along Camellia Drive and Jasmine Way, as well as to the homes under construction and the East Palo Alto Charter School at the end of Runnymede Street, is to tunnel the new Bypass beginning at a point before Runnymede and emerging just before the bridge over San Francisquito Creek. The tunnel would also avoid impacts to users of the trail along the Palo Alto Baylands and to endangered species in the Baylands. The new road could also be restricted for use by trucks. Alternatively, the road could be constructed within the right-of-way of the existing PG&E power lines, undergrounding the lines as a mitigation.

At the south end of the project, two design variations have been defined. The first (Option A) would cross San Francisquito Creek on a 1,000-foot long bridge. The bridge would join the ground and bisect the Baylands Athletic Center, a facility operated by the City of Palo Alto. An existing ballfield within the athletic center could be avoided by the bridge and at-grade roadway.

In Option A, the at-grade two lane facility would then enter a box tunnel underneath parking lots of office buildings near Embarcadero Road. The portal of the proposed tunnel begins approximately 1,100 feet north of Embarcadero Road. The 1,800-foot tunnel would run under the parking lots of office buildings north of Embarcadero Road (generally following the overhead utility lines) and would continue beneath the existing East Bayshore frontage road south of the Embarcadero Road and Oregon Expressway interchanges, thereby avoiding major land use conflicts with existing structures, although construction impacts of constructing the cut-and-cover tunnel could be significant. The road would emerge from the tunnel before merging with Highway 101. At least one commercial structure near the merge point may require removal.

Option B would transition into a bored tunnel north of San Francisquito Creek, passing beneath the creek in a jacked tunnel. The two-lane roadway bore would continue south beneath existing businesses and roadway facilities in the vicinity of the Embarcadero Road and Oregon Expressway interchanges, thereby avoiding major land use conflicts with existing structures, although construction impacts of boring the tunnel could be significant near the portal locations. The road would emerge from the tunnel before merging with Highway 101. At least one commercial structure near the merge point may require removal.

**Biology**

Under this alternative, there would be no major aquatic habitat issues that could affect the San Francisco Bay since there are no proposed bridge improvements. However, the planned transportation improvements would impact diked historic wetlands, tidal wetlands, and nearby upland locations.

Possible major impacts are associated with placement of fill within jurisdictional wetlands and waters of the diked shoreline through Menlo Park and East Palo Alto. As noted above, construction of the causeway bypassing the Cargill Salt Pond could affect about 3.2 acres of wetland and upland habitat at the SFPUC property, and at least 3.4 acres of wetland habitat between East Palo Alto and the Ravenswood Preserve, assuming worst case effects of shading on wetland habitat. The bored tunnel alignment would avoid some of the impacts to the 3.2 acres of wetland and upland habitat at the SFPUC property.

The National Wetland Inventory published by the U.S. Fish and Wildlife Service identifies the Cargill salt ponds as lacustrine unconsolidated bottom wetlands (L2UB) ((USFWS, 2002). The SFPUC Sportsmen's Club property is identified as palustrine emergent wetlands, palustrine unconsolidated shore, and uplands (PEM,

PUS, and Upland). The lands south of the railroad tracks between the East Palo Alto homes and the Ravenswood Preserve are identified as estuarine intertidal emergent wetlands (E2EM).

Possible mitigation requirements for fill of wetlands has been discussed above under Alternative 3. Construction of an elevated causeway through wetlands areas would allow the passage of tidal waters under the causeway. Careful alignment of the road through the SFPUC Sportsmen's Club property could attempt to avoid some of the wetlands by using the uplands portion for the road. There would be no feasible mitigation to avoid the loss of wetlands between the Ravenswood Preserve, but the alignment could be refined to ensure that the existing slough and diked levee are avoided completely.

Potentially significant impacts on special-status species could also be associated with construction of the road within through the wetlands and upland habitat of the SFPUC and adjacent properties. These may include the salt marsh harvest mouse, clapper rail, and burrowing owl, among others. Direct disturbance to essential habitat of these species would occur under much of the proposed alignment for the Bypass. Mitigation would be required for impacts related to each of the listed species.

Clapper rails may be the species most sensitive to noise disturbance from construction and operation of the new Bypass, particularly during the breeding season (February-August). No controlled studies have been done to evaluate the effects of noise on rails, but there have been instances where it appears rails were adversely affected by noise or by human activity. The Fish and Wildlife Service generally recommends timing construction during the non-breeding season (September-February) or establishing a buffer distance between construction activity and potential nesting habitat. The Service has used 213 meter (700 feet) from a nest site or "call-count" center as a suitable buffer distance for most construction noise activities during the rail breeding season. This buffer distance has most often been used for anomalous noise/activity in relatively quiet habitat areas (Caltrans, 1996?, undated).

As noted above, a possible mitigation to avoid impacts to the homes along Camellia Drive and Jasmine Way is to tunnel the new Bypass beginning at a point before Runnymede and emerging just before the bridge over San Francisquito Creek. The tunnel would also avoid impacts to users of the trail along the Palo Alto Baylands and to endangered species in the Baylands.

**Geology**

The Hayward, San Andreas, and Calaveras faults are all located less than 20 miles from the project area. The components of this alternative do not cross the known active traces of these faults. Any improvements would need to incorporate the latest earthquake design standards.

**Water Quality/Dredging**

Typical water quality impacts and mitigation through preparation of a Storm Water Pollution Prevention Plan have already been discussed above in Alternative 3.

**Noise and Vibration**

Typical noise and vibration impacts and mitigation for heavy construction have already been discussed above in Alternative 3. If the mitigation to avoid impacts to the homes along Camellia Drive and Jasmine Way is to tunnel, noise and vibration impacts to the homes closest to the roadway would be largely avoided.

**Air Quality**

Localized air emissions, including particulate matter, would be generated by land clearing and grading, boring, and construction equipment. Typical air quality impacts and mitigation for heavy construction have already been discussed above in Alternative 3.

The change in ROG, NOx, and PM10 emissions at the regional level is less than 1%. These results are not considered significant (see Table 2 at the end of this report).

**Visual**

Visual impacts would be related to the construction and operation of the new roadway adjacent to existing residential neighborhoods in East Palo Alto and adjacent to the Ravenswood Open Space Preserve. The road would cause the potential loss of unimpeded views of salt marshes and the San Francisco Bay that may be experienced by existing residents. The proposed road would skirt diked Ravenswood marshlands along San Francisco Bay that are used by the public for hiking and birdwatching. A 1.2 mile trail along the diked levee of the Ravenswood Preserve would pass directly adjacent to the road. Users of the trail would lose the open views toward the nearest East Palo Alto homes and would instead see the new roadway and soundwalls, if they are required.

**Economic Development**

The construction of the new approach road could significantly improve circulation during peak periods, reducing traffic on the local roadways serving residents and businesses in Menlo Park, Palo Alto, and East Palo Alto (e.g. Willow, University, and Bay), thereby facilitating planned and proposed economic development.

**Equity**

The City of East Palo Alto is currently extremely impacted by traffic to and from the Dumbarton Bridge using University Avenue. The City of East Palo Alto is one of the Metropolitan Transportation Commission's identified communities of concern. Any improvements that provide traffic relief and a more balanced sharing of regional traffic loads would be considered a positive impact from an environmental justice perspective. In addition, East Palo Alto residents would have improved access to regional job opportunities. On the other hand, construction of the new road around the edge of an existing neighborhood in East Palo Alto could

adversely affect the homes nearest the roadway alignment. As noted above, using a tunnel for a portion of the roadway would mitigate most of these impacts.

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Table 2

Regional Mobile Source Emissions Estimates, Year 2025

Bay Crossing Study

| | Alt #0 | Alt #1 | Alt #2 | Alt #3 | Alt #4 | Alt #5 | Alt #6 |
|---|---|---|---|---|---|---|---|
| Regional "Activity" Data | | | | | | | |
| Vehicles in Use | 6,283,257 | 6,283,257 | 6,283,257 | 6,283,257 | 6,283,257 | 6,283,257 | 6,283,257 |
| VMT (in 1000s) | 189,822 | 189,871 | 189,864 | 190,105 | 189,918 | 189,571 | 190,066 |
| Engine Starts | 27,691,648 | 27,679,871 | 27,673,284 | 27,696,683 | 27,713,770 | 27,682,058 | 27,697,371 |
| Regional Mobile Source Emissions (Tons per Day) | | | | | | | |
| ROG | 46.32 | 46.21 | 46.64 | 46.64 | 45.90 | 46.31 | 46.47 |
| NOX | 145.87 | 145.82 | 146.18 | 146.34 | 146.13 | 145.72 | 146.06 |
| PM10 | 7.15 | 7.15 | 7.15 | 7.16 | 7.16 | 7.14 | 7.16 |
| CO | 773.62 | 772.77 | 775.77 | 776.68 | 771.55 | 773.26 | 775.58 |
| Change from the Baseline in Regional Activity Data and Mobile Source Emissions | | | | | | | |
| Vehicles in Use | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| VMT (in 1000s) | | 0.03% | 0.02% | 0.15% | 0.05% | -0.13% | 0.13% |
| Engine Starts | | -0.04% | -0.07% | 0.02% | 0.08% | -0.03% | 0.02% |
| ROG | | -0.24% | 0.69% | 0.69% | -0.91% | -0.02% | 0.32% |
| NOX | | -0.03% | 0.21% | 0.32% | 0.18% | -0.10% | 0.13% |
| PM10 | | 0.00% | 0.00% | 0.14% | 0.14% | -0.14% | 0.14% |
| CO | | -0.11% | 0.28% | 0.40% | -0.27% | -0.05% | 0.25% |